

This drawing is a schematic diagram of a fuel cell stack. It shows a cross-section of the stack with various layers and components labeled with reference numerals. The stack includes a top plate (10), a top gas diffusion layer (12), a top catalyst layer (14), a top electrolyte layer (16), a top interconnect (18), a middle gas diffusion layer (20), a middle catalyst layer (22), a middle electrolyte layer (24), a middle interconnect (26), a bottom gas diffusion layer (28), a bottom catalyst layer (30), a bottom electrolyte layer (32), a bottom interconnect (34), and a bottom plate (36). The diagram also shows the flow of reactants (H<sub>2</sub> and O<sub>2</sub>) and the resulting products (H<sub>2</sub>O and CO<sub>2</sub>) through the stack.

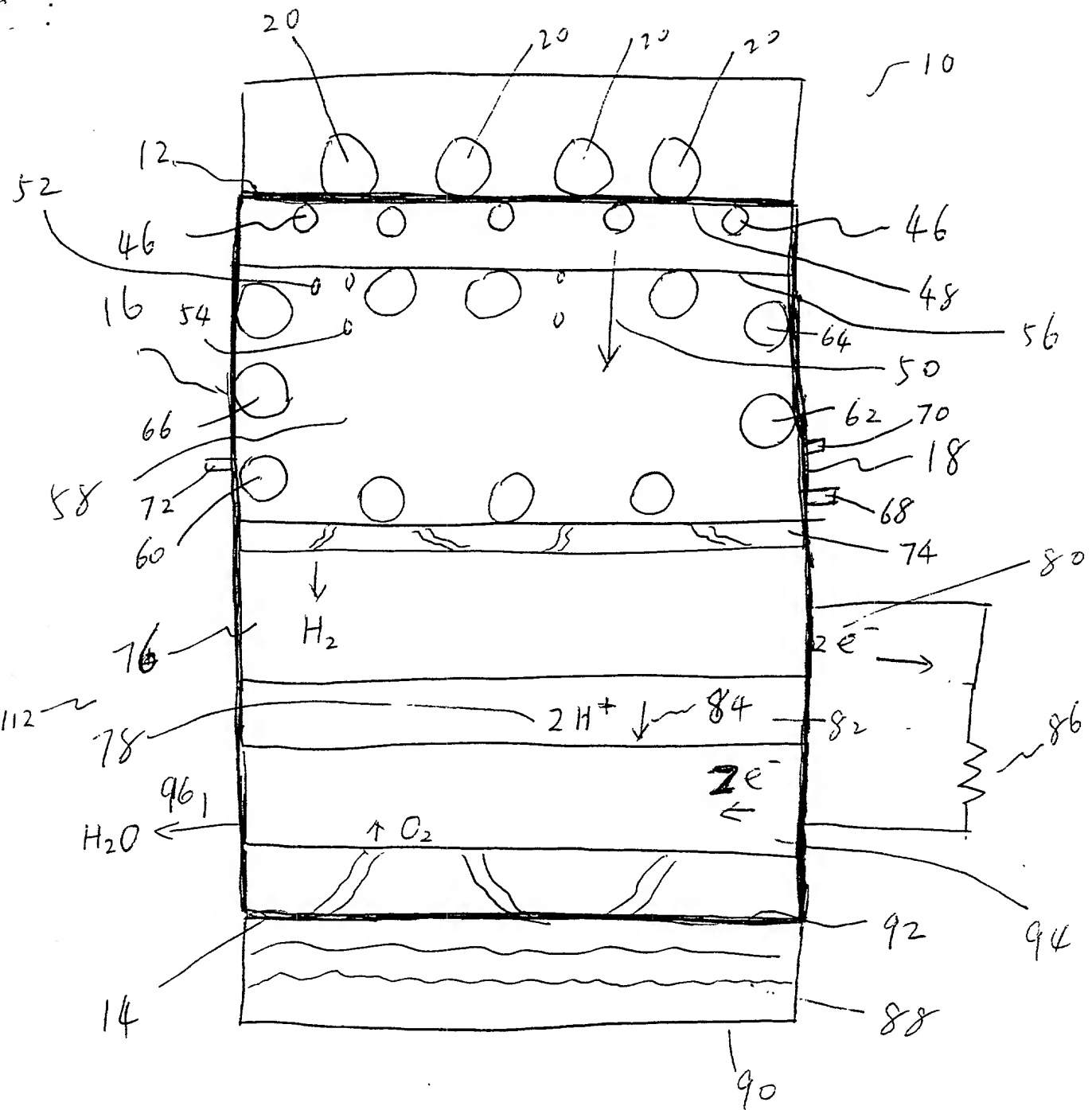


FIGURE 1

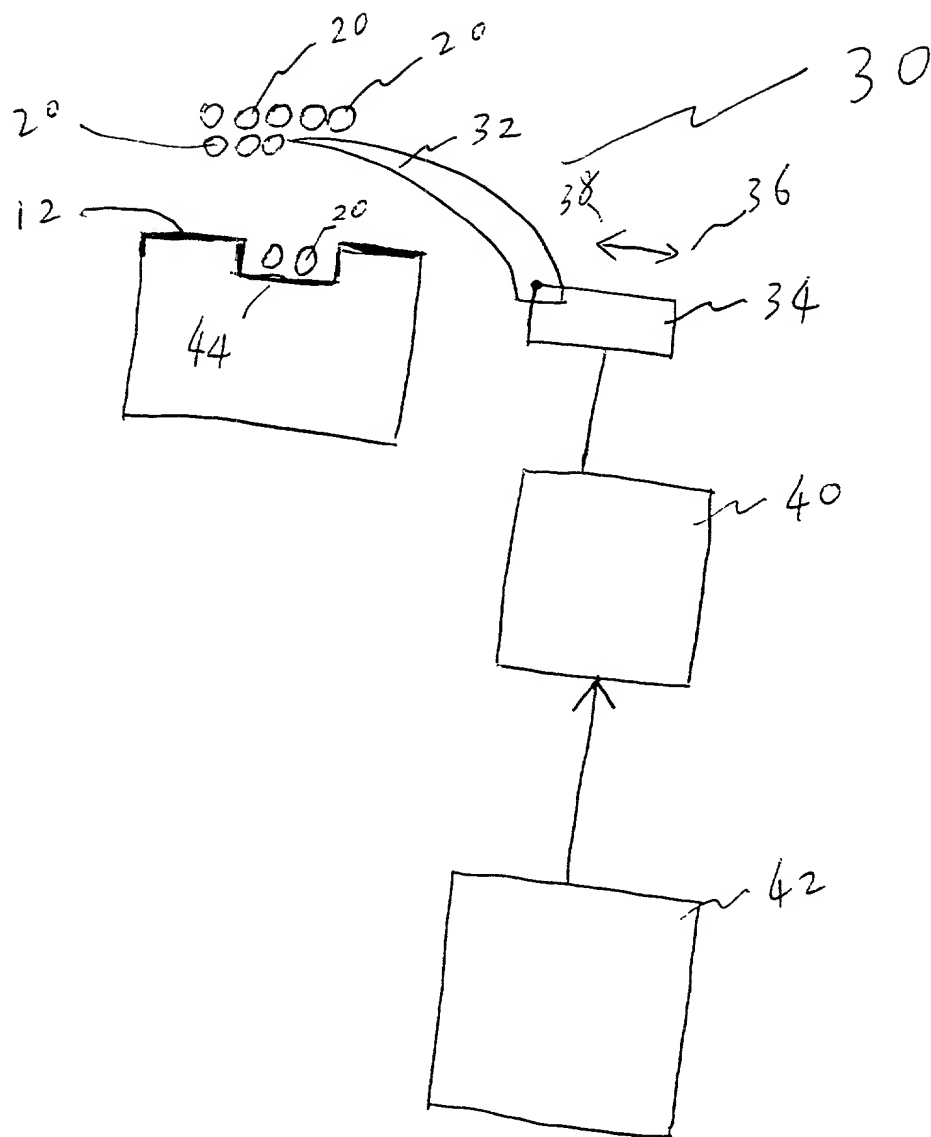


FIGURE 1A

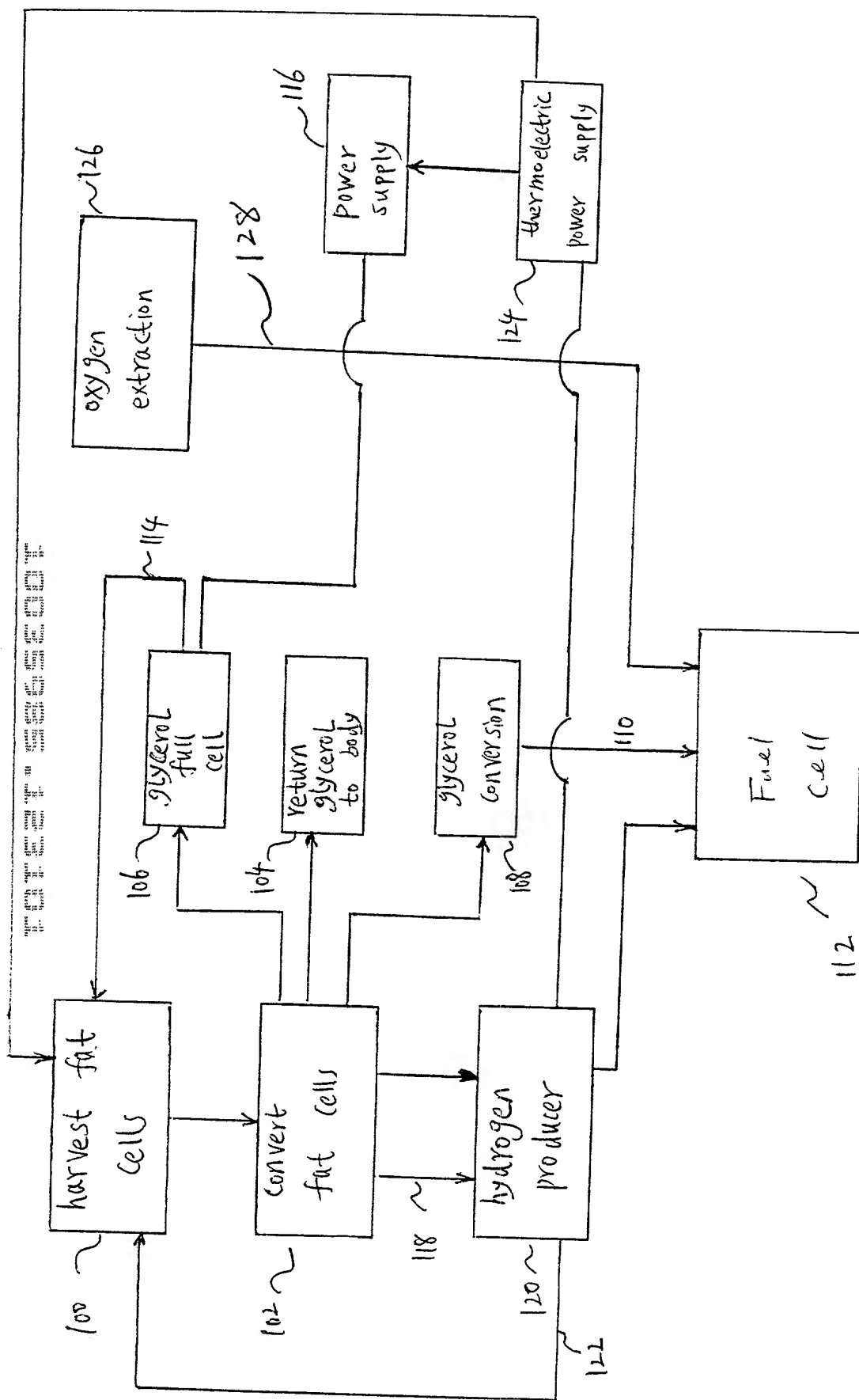


FIGURE 2

112

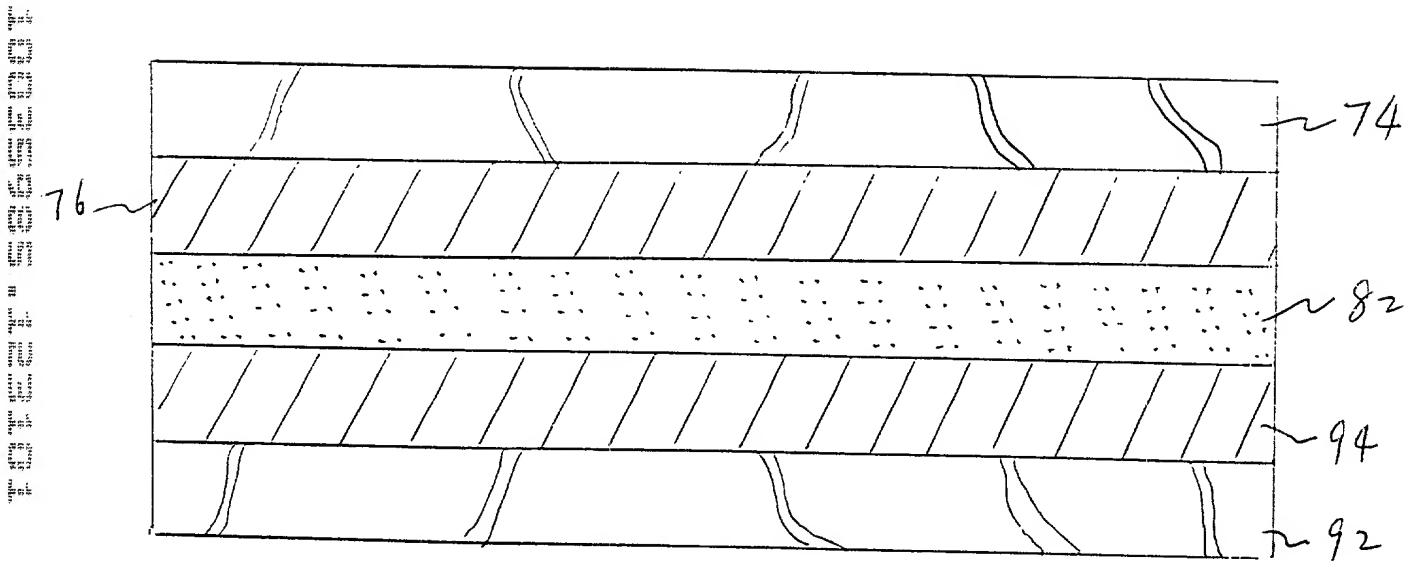


Figure 3

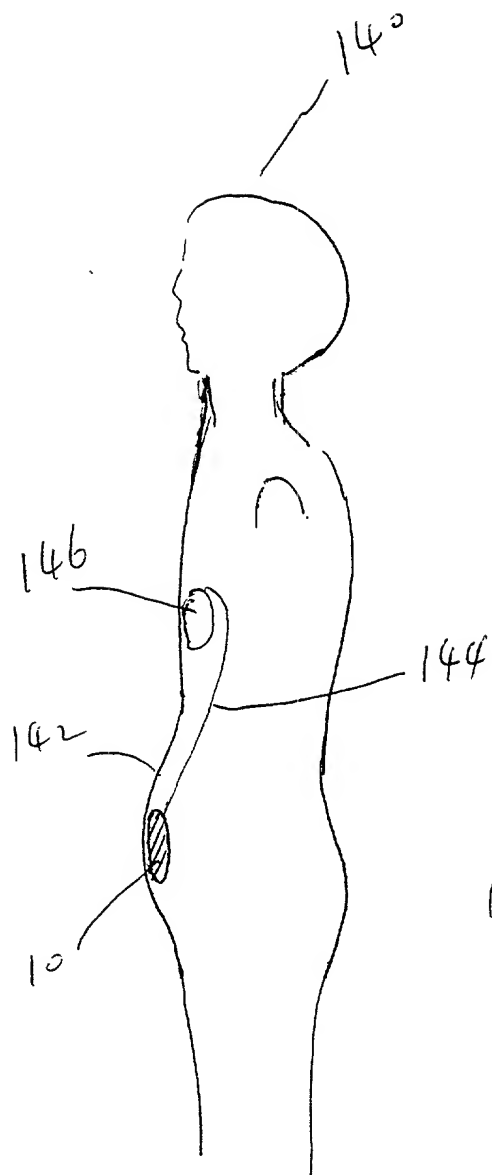


FIGURE 4A

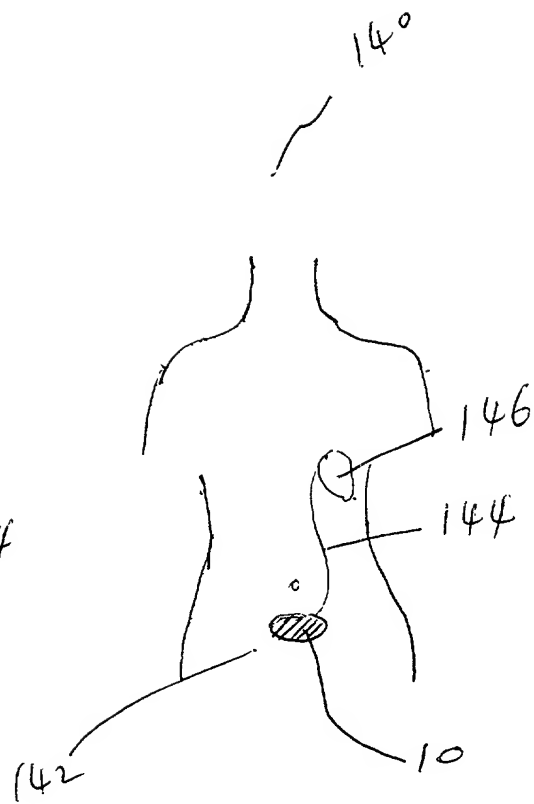


FIGURE 4B

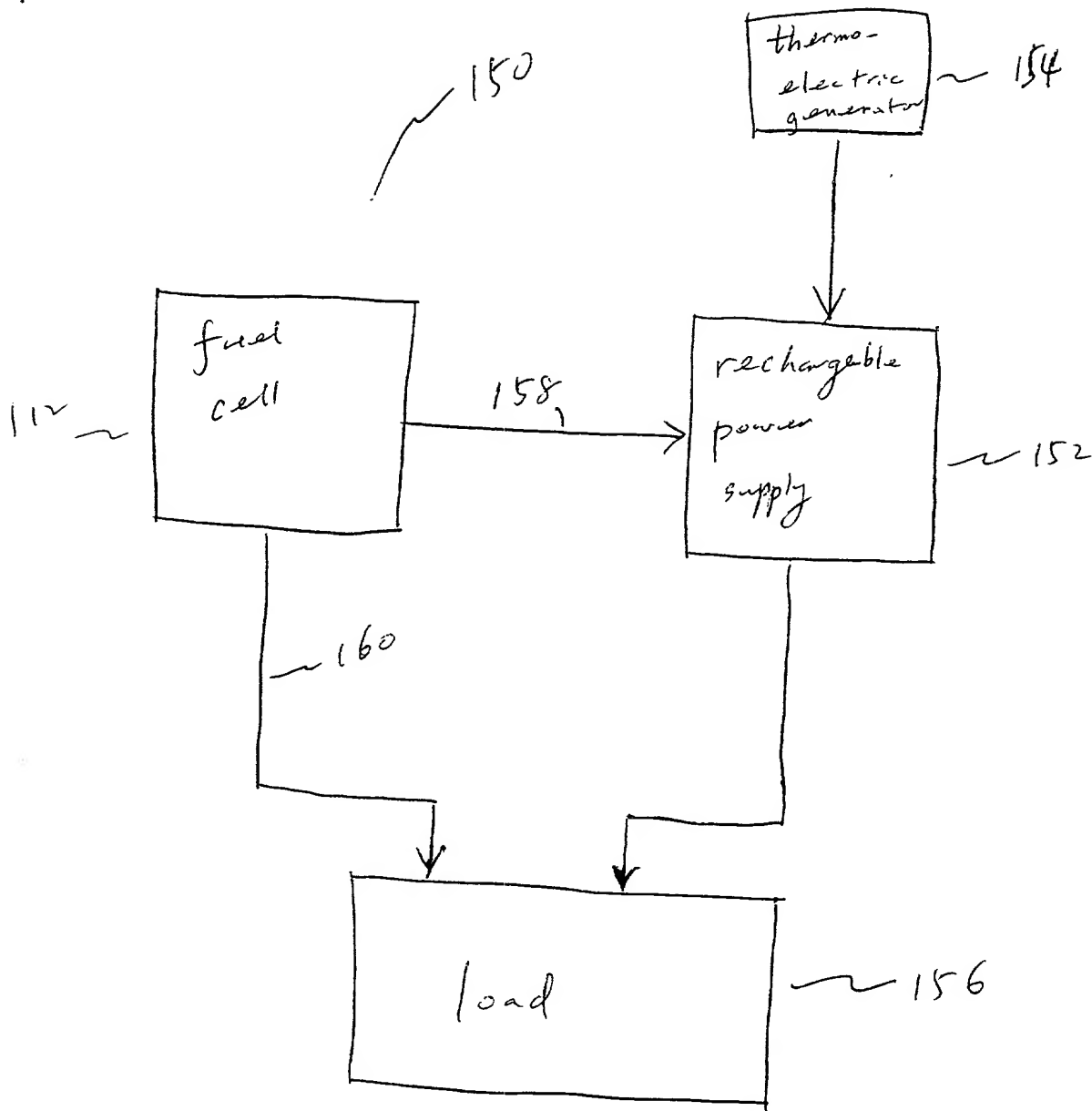


FIGURE 5

FIG. 6 is a schematic diagram of a power system 170. The system includes a fuel cell 112 and a thermoelectric generator 154. The fuel cell 112 is connected to a switch 174, which is connected to a battery 180. The thermoelectric generator 154 is connected to a switch 176, which is connected to a battery 182. The batteries 180 and 182 are connected in series with a battery 184 and a load 186. The load 186 is connected to a switch 188, which is connected back to the fuel cell 112. The entire system is labeled 178.

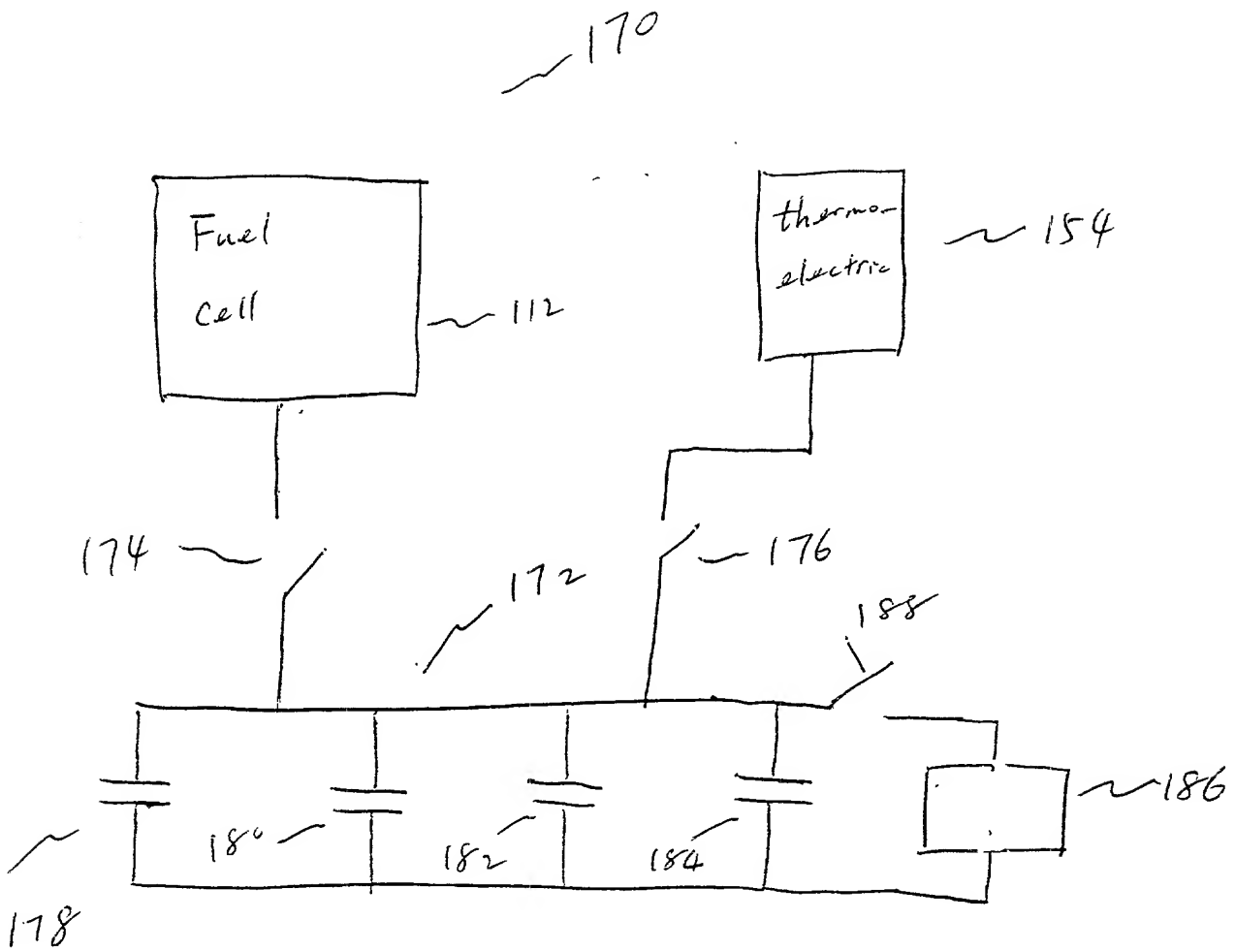


FIGURE 6

FIG. 7 is a schematic diagram of a circuit 100. The circuit 100 includes a power source 112, a first diode 114, a second diode 116, a third diode 118, a fourth diode 120, a fifth diode 122, a sixth diode 124, a seventh diode 126, an eighth diode 128, a ninth diode 130, a tenth diode 132, an eleventh diode 134, a twelfth diode 136, a thirteenth diode 138, a fourteenth diode 140, a fifteenth diode 142, a sixteenth diode 144, a seventeenth diode 146, an eighteenth diode 148, a nineteenth diode 150, a twentieth diode 152, a twenty-first diode 154, a twenty-second diode 156, a twenty-third diode 158, a twenty-fourth diode 160, a twenty-fifth diode 162, a twenty-sixth diode 164, a twenty-seventh diode 166, a twenty-eighth diode 168, a twenty-ninth diode 170, a thirtieth diode 172, a thirty-first diode 174, a thirty-second diode 176, a thirty-third diode 178, a thirty-fourth diode 180, a thirty-fifth diode 182, a thirty-sixth diode 184, a thirty-seventh diode 186, a thirty-eighth diode 188, a thirty-ninth diode 190, a fortieth diode 192, a forty-first diode 194, a forty-second diode 196, a forty-third diode 198, a forty-fourth diode 200, a forty-fifth diode 202, a forty-sixth diode 204, a forty-seventh diode 206, a forty-eighth diode 208, a forty-ninth diode 210, a fiftieth diode 212, a fifty-first diode 214, a fifty-second diode 216, a fifty-third diode 218, a fifty-fourth diode 220, a fifty-fifth diode 222, a fifty-sixth diode 224, a fifty-seventh diode 226, a fifty-eighth diode 228, a fifty-ninth diode 230, a sixtieth diode 232, a sixty-first diode 234, a sixty-second diode 236, a sixty-third diode 238, a sixty-fourth diode 240, a sixty-fifth diode 242, a sixty-sixth diode 244, a sixty-seventh diode 246, a sixty-eighth diode 248, a sixty-ninth diode 250, a seventieth diode 252, a seventy-first diode 254, a seventy-second diode 256, a seventy-third diode 258, a seventy-fourth diode 260, a seventy-fifth diode 262, a seventy-sixth diode 264, a seventy-seventh diode 266, a seventy-eighth diode 268, a seventy-ninth diode 270, an eightieth diode 272, an eighty-first diode 274, an eighty-second diode 276, an eighty-third diode 278, an eighty-fourth diode 280, an eighty-fifth diode 282, an eighty-sixth diode 284, an eighty-seventh diode 286, an eighty-eighth diode 288, an eighty-ninth diode 290, a ninetieth diode 292, a hundredth diode 294, a hundred-first diode 296, a hundred-second diode 298, a hundred-third diode 300, a hundred-fourth diode 302, a hundred-fifth diode 304, a hundred-sixth diode 306, a hundred-seventh diode 308, a hundred-eighth diode 310, a hundred-ninth diode 312, a hundred-tenth diode 314, a hundred-eleventh diode 316, a hundred-twelfth diode 318, a hundred-thirteenth diode 320, a hundred-fourteenth diode 322, a hundred-fifteenth diode 324, a hundred-sixteenth diode 326, a hundred-seventeenth diode 328, a hundred-eighteenth diode 330, a hundred-nineteenth diode 332, a hundred-twentieth diode 334, a hundred-twenty-first diode 336, a hundred-twenty-second diode 338, a hundred-twenty-third diode 340, a hundred-twenty-fourth diode 342, a hundred-twenty-fifth diode 344, a hundred-twenty-sixth diode 346, a hundred-twenty-seventh diode 348, a hundred-twenty-eighth diode 350, a hundred-twenty-ninth diode 352, a hundred-thirtieth diode 354, a hundred-thirty-first diode 356, a hundred-thirty-second diode 358, a hundred-thirty-third diode 360, a hundred-thirty-fourth diode 362, a hundred-thirty-fifth diode 364, a hundred-thirty-sixth diode 366, a hundred-thirty-seventh diode 368, a hundred-thirty-eighth diode 370, a hundred-thirty-ninth diode 372, a hundred-fortieth diode 374, a hundred-forty-first diode 376, a hundred-forty-second diode 378, a hundred-forty-third diode 380, a hundred-forty-fourth diode 382, a hundred-forty-fifth diode 384, a hundred-forty-sixth diode 386, a hundred-forty-seventh diode 388, a hundred-forty-eighth diode 390, a hundred-forty-ninth diode 392, a hundred-fiftieth diode 394, a hundred-fifty-first diode 396, a hundred-fifty-second diode 398, a hundred-fifty-third diode 400, a hundred-fifty-fourth diode 402, a hundred-fifty-fifth diode 404, a hundred-fifty-sixth diode 406, a hundred-fifty-seventh diode 408, a hundred-fifty-eighth diode 410, a hundred-fifty-ninth diode 412, a hundred-sixtieth diode 414, a hundred-sixty-first diode 416, a hundred-sixty-second diode 418, a hundred-sixty-third diode 420, a hundred-sixty-fourth diode 422, a hundred-sixty-fifth diode 424, a hundred-sixty-sixth diode 426, a hundred-sixty-seventh diode 428, a hundred-sixty-eighth diode 430, a hundred-sixty-ninth diode 432, a hundred-seventieth diode 434, a hundred-seventy-first diode 436, a hundred-seventy-second diode 438, a hundred-seventy-third diode 440, a hundred-seventy-fourth diode 442, a hundred-seventy-fifth diode 444, a hundred-seventy-sixth diode 446, a hundred-seventy-seventh diode 448, a hundred-seventy-eighth diode 450, a hundred-seventy-ninth diode 452, a hundred-eightieth diode 454, a hundred-eighty-first diode 456, a hundred-eighty-second diode 458, a hundred-eighty-third diode 460, a hundred-eighty-fourth diode 462, a hundred-eighty-fifth diode 464, a hundred-eighty-sixth diode 466, a hundred-eighty-seventh diode 468, a hundred-eighty-eighth diode 470, a hundred-eighty-ninth diode 472, a hundred-ninetyth diode 474, a hundred-ninety-first diode 476, a hundred-ninety-second diode 478, a hundred-ninety-third diode 480, a hundred-ninety-fourth diode 482, a hundred-ninety-fifth diode 484, a hundred-ninety-sixth diode 486, a hundred-ninety-seventh diode 488, a hundred-ninety-eighth diode 490, a hundred-ninety-ninth diode 492, a two-hundredth diode 494, a two-hundred-first diode 496, a two-hundred-second diode 498, a two-hundred-third diode 500, a two-hundred-fourth diode 502, a two-hundred-fifth diode 504, a two-hundred-sixth diode 506, a two-hundred-seventh diode 508, a two-hundred-eighth diode 510, a two-hundred-ninth diode 512, a two-hundred-tenth diode 514, a two-hundred-eleventh diode 516, a two-hundred-twelfth diode 518, a two-hundred-thirteenth diode 520, a two-hundred-fourteenth diode 522, a two-hundred-fifteenth diode 524, a two-hundred-sixteenth diode 526, a two-hundred-seventeenth diode 528, a two-hundred-eighteenth diode 530, a two-hundred-nineteenth diode 532, a two-hundred-twentieth diode 534, a two-hundred-twenty-first diode 536, a two-hundred-twenty-second diode 538, a two-hundred-twenty-third diode 540, a two-hundred-twenty-fourth diode 542, a two-hundred-twenty-fifth diode 544, a two-hundred-twenty-sixth diode 546, a two-hundred-twenty-seventh diode 548, a two-hundred-twenty-eighth diode 550, a two-hundred-twenty-ninth diode 552, a two-hundred-thirtieth diode 554, a two-hundred-thirty-first diode 556, a two-hundred-thirty-second diode 558, a two-hundred-thirty-third diode 560, a two-hundred-thirty-fourth diode 562, a two-hundred-thirty-fifth diode 564, a two-hundred-thirty-sixth diode 566, a two-hundred-thirty-seventh diode 568, a two-hundred-thirty-eighth diode 570, a two-hundred-thirty-ninth diode 572, a two-hundred-fortieth diode 574, a two-hundred-forty-first diode 576, a two-hundred-forty-second diode 578, a two-hundred-forty-third diode 580, a two-hundred-forty-fourth diode 582, a two-hundred-forty-fifth diode 584, a two-hundred-forty-sixth diode 586, a two-hundred-forty-seventh diode 588, a two-hundred-forty-eighth diode 590, a two-hundred-forty-ninth diode 592, a two-hundred-fiftieth diode 594, a two-hundred-fifty-first diode 596, a two-hundred-fifty-second diode 598, a two-hundred-fifty-third diode 600, a two-hundred-fifty-fourth diode 602, a two-hundred-fifty-fifth diode 604, a two-hundred-fifty-sixth diode 606, a two-hundred-fifty-seventh diode 608, a two-hundred-fifty-eighth diode 610, a two-hundred-fifty-ninth diode 612, a two-hundred-sixtieth diode 614, a two-hundred-sixty-first diode 616, a two-hundred-sixty-second diode 618, a two-hundred-sixty-third diode 620, a two-hundred-sixty-fourth diode 622, a two-hundred-sixty-fifth diode 624, a two-hundred-sixty-sixth diode 626, a two-hundred-sixty-seventh diode 628, a two-hundred-sixty-eighth diode 630, a two-hundred-sixty-ninth diode 632, a two-hundred-seventieth diode 634, a two-hundred-seventy-first diode 636, a two-hundred-seventy-second diode 638, a two-hundred-seventy-third diode 640, a two-hundred-seventy-fourth diode 642, a two-hundred-seventy-fifth diode 644, a two-hundred-seventy-sixth diode 646, a two-hundred-seventy-seventh diode 648, a two-hundred-seventy-eighth diode 650, a two-hundred-seventy-ninth diode 652, a two-hundred-eightieth diode 654, a two-hundred-eighty-first diode 656, a two-hundred-eighty-second diode 658, a two-hundred-eighty-third diode 660, a two-hundred-eighty-fourth diode 662, a two-hundred-eighty-fifth diode 664, a two-hundred-eighty-sixth diode 666, a two-hundred-eighty-seventh diode 668, a two-hundred-eighty-eighth diode 670, a two-hundred-eighty-ninth diode 672, a two-hundred-ninetyth diode 674, a two-hundred-ninety-first diode 676, a two-hundred-ninety-second diode 678, a two-hundred-ninety-third diode 680, a two-hundred-ninety-fourth diode 682, a two-hundred-ninety-fifth diode 684, a two-hundred-ninety-sixth diode 686, a two-hundred-ninety-seventh diode 688, a two-hundred-ninety-eighth diode 690, a two-hundred-ninety-ninth diode 692, a three-hundredth diode 694, a three-hundred-first diode 696, a three-hundred-second diode 698, a three-hundred-third diode 700, a three-hundred-fourth diode 702, a three-hundred-fifth diode 704, a three-hundred-sixth diode 706, a three-hundred-seventh diode 708, a three-hundred-eighth diode 710, a three-hundred-ninth diode 712, a three-hundred-tenth diode 714, a three-hundred-eleventh diode 716, a three-hundred-twelfth diode 718, a three-hundred-thirteenth diode 720, a three-hundred-fourteenth diode 722, a three-hundred-fifteenth diode 724, a three-hundred-sixteenth diode 726, a three-hundred-seventeenth diode 728, a three-hundred-eighteenth diode 730, a three-hundred-nineteenth diode 732, a three-hundred-twentieth diode 734, a three-hundred-twenty-first diode 736, a three-hundred-twenty-second diode 738, a three-hundred-twenty-third diode 740, a three-hundred-twenty-fourth diode 742, a three-hundred-twenty-fifth diode 744, a three-hundred-twenty-sixth diode 746, a three-hundred-twenty-seventh diode 748, a three-hundred-twenty-eighth diode 750, a three-hundred-twenty-ninth diode 752, a three-hundred-thirtieth diode 754, a three-hundred-thirty-first diode 756, a three-hundred-thirty-second diode 758, a three-hundred-thirty-third diode 760, a three-hundred-thirty-fourth diode 762, a three-hundred-thirty-fifth diode 764, a three-hundred-thirty-sixth diode 766, a three-hundred-thirty-seventh diode 768, a three-hundred-thirty-eighth diode 770, a three-hundred-thirty-ninth diode 772, a three-hundred-fortieth diode 774, a three-hundred-forty-first diode 776, a three-hundred-forty-second diode 778, a three-hundred-forty-third diode 780, a three-hundred-forty-fourth diode 782, a three-hundred-forty-fifth diode 784, a three-hundred-forty-sixth diode 786, a three-hundred-forty-seventh diode 788, a three-hundred-forty-eighth diode 790, a three-hundred-forty-ninth diode 792, a three-hundred-fiftieth diode 794, a three-hundred-fifty-first diode 796, a three-hundred-fifty-second diode 798, a three-hundred-fifty-third diode 800, a three-hundred-fifty-fourth diode 802, a three-hundred-fifty-fifth diode 804, a three-hundred-fifty-sixth diode 806, a three-hundred-fifty-seventh diode 808, a three-hundred-fifty-eighth diode 810, a three-hundred-fifty-ninth diode 812, a three-hundred-sixtieth diode 814, a three-hundred-sixty-first diode 816, a three-hundred-sixty-second diode 818, a three-hundred-sixty-third diode 820, a three-hundred-sixty-fourth diode 822, a three-hundred-sixty-fifth diode 824, a three-hundred-sixty-sixth diode 826, a three-hundred-sixty-seventh diode 828, a three-hundred-sixty-eighth diode 830, a three-hundred-sixty-ninth diode 832, a three-hundred-seventieth diode 834, a three-hundred-seventy-first diode 836, a three-hundred-seventy-second diode 838, a three-hundred-seventy-third diode 840, a three-hundred-seventy-fourth diode 842, a three-hundred-seventy-fifth diode 844, a three-hundred-seventy-sixth diode 846, a three-hundred-seventy-seventh diode 848, a three-hundred-seventy-eighth diode 850, a three-hundred-seventy-ninth diode 852, a three-hundred-eightieth diode 854, a three-hundred-eighty-first diode 856, a three-hundred-eighty-second diode 858, a three-hundred-eighty-third diode 860, a three-hundred-eighty-fourth diode 862, a three-hundred-eighty-fifth diode 864, a three-hundred-eighty-sixth diode 866, a three-hundred-eighty-seventh diode 868, a three-hundred-eighty-eighth diode 870, a three-hundred-eighty-ninth diode 872, a three-hundred-ninetyth diode 874, a three-hundred-ninety-first diode 876, a three-hundred-ninety-second diode 878, a three-hundred-ninety-third diode 880, a three-hundred-ninety-fourth diode 882, a three-hundred-ninety-fifth diode 884, a three-hundred-ninety-sixth diode 886, a three-hundred-ninety-seventh diode 888, a three-hundred-ninety-eighth diode 890, a three-hundred-ninety-ninth diode 892, a four-hundredth diode 894, a four-hundred-first diode 896, a four-hundred-second diode 898, a four-hundred-third diode 900, a four-hundred-fourth diode 902, a four-hundred-fifth diode 904, a four-hundred-sixth diode 906, a four-hundred-seventh diode 908, a four-hundred-eighth diode 910, a four-hundred-ninth diode 912, a four-hundred-tenth diode 914, a four-hundred-eleventh diode 916, a four-hundred-twelfth diode 918, a four-hundred-thirteenth diode 920, a four-hundred-fourteenth diode 922, a four-hundred-fifteenth diode 924, a four-hundred-sixteenth diode 926, a four-hundred-seventeenth diode 928, a four-hundred-eighteenth diode 930, a four-hundred-nineteenth diode 932, a four-hundred-twentieth diode 934, a four-hundred-twenty-first diode 936, a four-hundred-twenty-second diode 938, a four-hundred-twenty-third diode 940, a four-hundred-twenty-fourth diode 942, a four-hundred-twenty-fifth diode 944, a four-hundred-twenty-sixth diode 946, a four-hundred-twenty-seventh diode 948, a four-hundred-twenty-eighth diode 950, a four-hundred-twenty-ninth diode 952, a four-hundred-thirtieth diode 954, a four-hundred-thirty-first diode 956, a four-hundred-thirty-second diode 958, a four-hundred-thirty-third diode 960, a four-hundred-thirty-fourth diode 962, a four-hundred-thirty-fifth diode 964, a four-hundred-thirty-sixth diode 966, a four-hundred-thirty-seventh diode 968, a four-hundred-thirty-eighth diode 970, a four-hundred-thirty-ninth diode 972, a four-hundred-fortieth diode 974, a four-hundred-forty-first diode 976, a four-hundred-forty-second diode 978, a four-hundred-forty-third diode 980, a four-hundred-forty-fourth diode 982, a four-hundred-forty-fifth diode 984, a four-hundred-forty-sixth diode 986, a four-hundred-forty-seventh diode 988, a four-hundred-forty-eighth diode 990, a four-hundred-forty-ninth diode 992, a four-hundred-fiftieth diode 994, a four-hundred-fifty-first diode 996, a four-hundred-fifty-second diode 998, a four-hundred-fifty-third diode 1000.

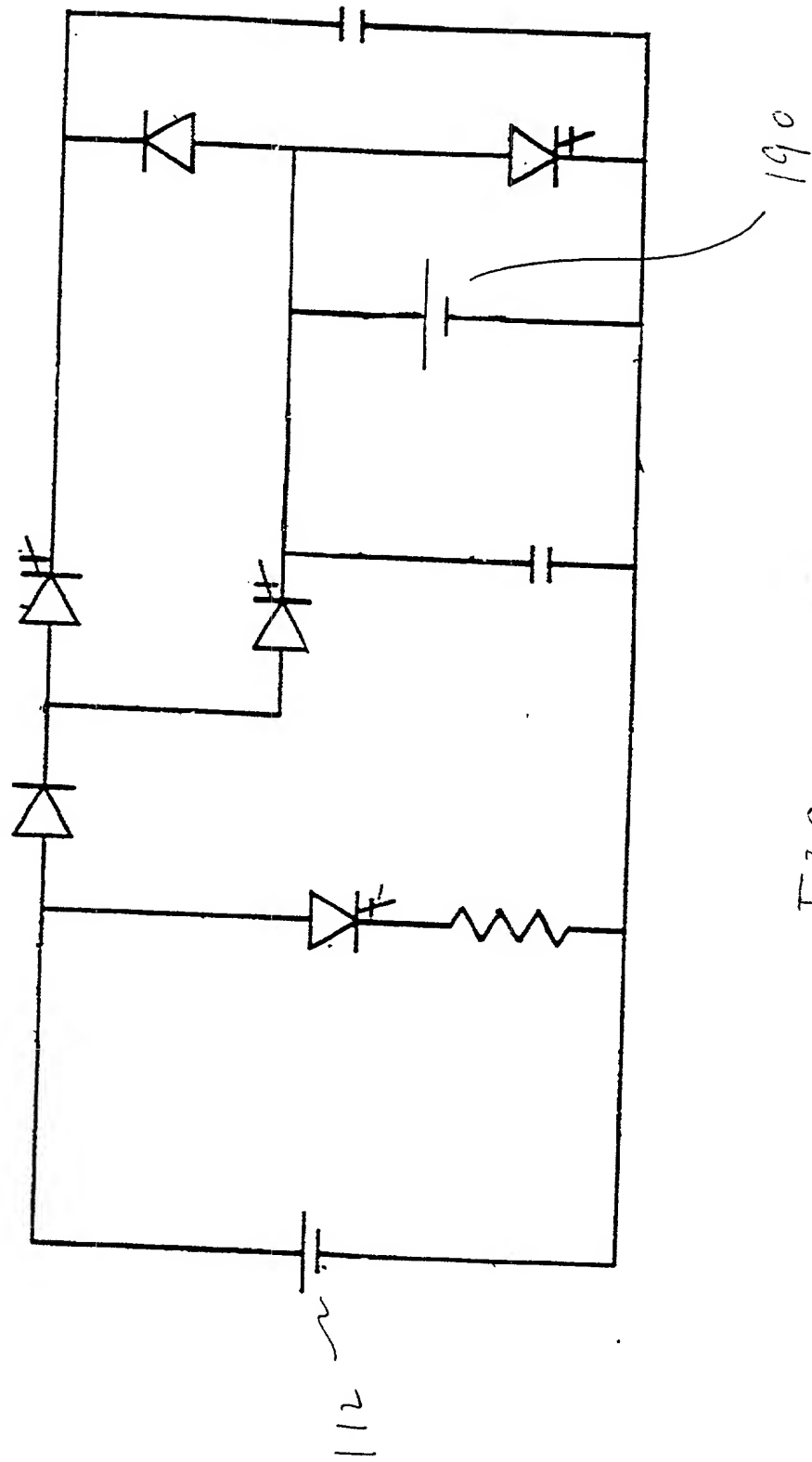


FIGURE 7